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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/706,156	11/12/2003	Tai-Chun Huang	TSM03-0340	7569
25962	7590	06/02/2006	EXAMINER	
SLATER & MATSIL, L.L.P. 17950 PRESTON RD, SUITE 1000 DALLAS, TX 75252-5793			OWENS, DOUGLAS W	
			ART UNIT	PAPER NUMBER
			2811	

DATE MAILED: 06/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/706,156

Applicant(s)

HUANG ET AL.

Examiner

Douglas W. Owens

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 March 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-59 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 8-51 and 56-59 is/are allowed.
- 6) ☒ Claim(s) 1,4-6,52 and 54 is/are rejected.
- 7) ☒ Claim(s) 2,3,7,53 and 55 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 4 – 6, 52 and 54 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent No. 6,069,400 to Kimura et al.

Regarding claim 1, Kimura et al. teach a method of manufacturing an inter-level dielectric layer of a semiconductor device (Figs. 4 and 23, for example), the method comprising:

forming an etch-stop layer (17) over a substrate;

forming a first low-dielectric constant material sub-layer (5f) over the substrate, the first low-dielectric constant material having at least one first material property;

forming a second low-dielectric constant material sub-layer (3) over the first low-dielectric constant material sub-layer, the second low-dielectric constant material sub-layer having at least one second material property, wherein the at least one second material property is different from the at least one first material property; and

forming a third low-dielectric constant material sub-layer (6f) over the second low-dielectric constant material sub-layer, the third low-dielectric constant material sub-layer having at least one third material property, the at least one third material property being different from the at least one second material property, wherein the first low-

dielectric constant material sub-layer, the second low-dielectric constant material sub-layer, and the third low-dielectric constant material sub-layer form a single ILD layer.

Regarding claim 4, Kimura et al. inherently teach a method, wherein manufacturing the ILD layer comprises forming the first low-dielectric constant material sub-layer, second low-dielectric constant material sub-layer, and third low-dielectric constant material sub-layer while adjusting the deposition conditions. The different material layers require adjusting deposition conditions.

Regarding claim 5, Kimura et al. inherently teach a method, wherein adjusting the deposition conditions comprises adjusting the power, since deposition of each layer would require different power.

Regarding claims 6 and 54, Kimura et al. teach a product and method wherein the first material property, second material property and third material property comprise density and dielectric constant.

Regarding claim 52, Kimura et al. teach an inter-level layer of a semiconductor device, comprising:

- a first low-dielectric constant material sub-layer (5f), the first low-dielectric constant material having at least one first material property;

- a second low-dielectric constant material sub-layer (3) disposed over the first low-dielectric constant material sub-layer, the second low-dielectric constant material sub-layer having at least one second material property, wherein the at least one second material property is different from the at least one first material property; and

a third low-dielectric constant material sub-layer disposed over the second low dielectric constant material sub-layer, the third low-dielectric constant material sub-layer having at least one third material property, the at least one third material property being different from the at least one second material property, wherein the first low-dielectric constant material sub-layer, the second low-dielectric material sub-layer, and the third low-dielectric constant material sub-layer form a single ILD layer.

With respect to the requirement that first, second and third sub-layers be formed continuously from the same material in one or more deposition chambers, this is considered a product-by-process limitation. "Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

***Allowable Subject Matter***

3. Claims 8 – 51 and 56 – 59 are allowed.
4. Claims 2, 3, 7, 17, 18, 20, 53 and 55 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Response to Arguments***

5. Applicant's arguments filed March 15, 2006 have been fully considered but they are not persuasive.

6. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the first low-dielectric constant material sub-layer formed over the etch stop layer) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Claim 1 only requires that the first low-dielectric constant material sub-layer be formed over the substrate.

***Conclusion***

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas W. Owens whose telephone number is 571-272-1662. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Douglas W Owens  
Primary Examiner  
Art Unit 2811

DWO